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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/669,655	09/25/2003	Yasushi Kinoshita	Q77597	5578

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EXAMINER	
GEBREMARIAM, SAMUEL A	
ART UNIT	**PAPER NUMBER**
2811	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/669,655	KINOSHITA, YASUSHI	
	Examiner	Art Unit	
	Samuel A. Gebremariam	2811	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *06 March 2007*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-19* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-19* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Objections

1. Claim 15 is objected to because of the following informalities: line 2, the limitation of "said the" appears to be a typographical error. Appropriate correction is required.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 1, 3-5, 7, 9-10, 13-14, 16 and 18 are rejected under 35 U.S.C. 102(b) as being anticipated by Shirley et al., US patent No. 6,015,729.

Regarding claim 1, Shirley teaches (fig. 1) a semiconductor integrated circuit comprising a power supply wiring and a ground wiring (col. 2, lines 56-67) and a decoupling capacitor (24, 26, 28) formed between the power supply wiring (decoupling capacitors are usually formed between ground/power supply wiring, col. 2, lines 56-67) and the ground wiring, the decoupling capacitor having electrodes (24 and 28), wherein at least one of the electrodes of the decoupling capacitor comprises of a shield layer formed in a plane shape (28, portion of 28 that is contacting 16 appears to be plane shaped) on a semiconductor substrate (10), and the shield layer is electrically connected directly to the semiconductor substrate via a diffusion layer (16) and is fixed to a power supply potential or the ground potential (col. 2, lines 56-67) and the

decoupling capacitor (the decoupling capacitor 24, 26, 28) does not overlap the diffusion layer (16, refer to fig. 1, the decoupling capacitor is formed where 24, 26 and 28 overlap), wherein said at least of said electrodes comprising the shield layer is extended into the decoupling capacitor (fig. 1) while being in a same plane shaped portion that contacts the diffusion layer (fig. 1, shows the lower electrode of the decoupling capacitor (24) appears to be in the same plane as the plane shaped portion that contacts the diffusion layer).

Regarding claim 3, Shirley teaches (fig. 1) the entire claimed structure of claim 1 above including the shield layer (28) is obtained by covering a plurality of protrusions formed on the substrate (refer to fig. 1, protrusions caused due to fox region 20).

Regarding claim 4, Shirley teaches (fig. 1) the entire claimed structure of claims 1 and 3 above including a gate electrode (24 also servers as a gate electrode, col. 3, lines 1-13).

The limitation that the protrusions are formed simultaneously with the gate electrode by the same formation process for the gate electrode is not given patentable weight because it is considered a product-by-process claim. "[E]ven though product-by process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process." *In re Thorpe*, 777 F.2d 695, 698, 227 USPQ 964, 966 (Fed. Cir. 1985).

Regarding claims 5 and 16, Shirley teaches (fig. 1) the entire claimed structure of claims 1, 3 and 14 including the decoupling capacitor is formed on element isolation oxide film (refer to fox region 20 of fig. 1).

Regarding claim 7, Shirley teaches (fig. 1) the entire claimed structure of claim 1 above including the decoupling capacitor circuit is formed on an element isolation oxide (refer to fox region 20 of fig. 1).

Regarding claims 9, 10 and 18, Shirley teaches the entire claimed structure of claims 1, 3 and 14 above including the diffusion layer (16) is a well (12) contact diffusion layer fig. 1).

Regarding claim 13, Shirley teaches (fig. 1) the entire claimed structure of claim 1 above including the decoupling capacitor is located opposite side with reference to a near gate electrode formed on the semiconductor substrate (refer to fig. 2, where the gate electrode on the right hand side is formed is located opposite side with reference to a near gate electrode on the left).

Regarding claim 14, Shirley teaches (fig. 1) a semiconductor integrated circuit comprising: a power supply wiring; a ground wiring (col. 2, lines 56-67); and a decoupling capacitor (24,26,28) formed between the power supply wiring and the ground wiring (decoupling capacitors are usually formed between ground/power supply wiring, col. 2, lines 56-67), the decoupling capacitor having electrodes (24,26,28), wherein at least one of electrodes of the decoupling capacitor comprises a shield layer formed in a plane shape (28, portion of 28 that is contacting 16 appears to be plane shaped) on a semiconductor substrate, and the shield layer is electrically connected

directly to the semiconductor substrate via a diffusion layer (16), such that a plane shaped portion of the shield layer contacts the diffusion layer is a lowermost conductive layer on the semiconductor substrate (fig. 1, there appears no conductive layer directly below 16), the shield layer is fixed to a power supply potential or the ground potential (col. 2, lines 56-67), and the decoupling capacitor does not overlap the diffusion layer and is located adjacent to the diffusion layer (fig. 1).

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. Claims 2, 6, 8, 11-12, 15, 17 and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shirley in view of Tobita, US patent No. 5,801,412.

Regarding claims 2 and 15, Shirley teaches (fig. 1) the entire claimed structure of claims 1 and 14 above including another of the electrodes of the decoupling capacitor (24), which opposes the electrode comprising the shield layer (28).

Shirley does not explicitly teach a wiring layer connected to wirings on an uppermost layer of a multi-layer wiring structure via contact electrodes, and a capacitor insulating film for forming the decoupling capacitor is provided between the wiring layer and the shield layer.

Tobita teaches (fig. 5) a wiring layer (the wiring for either the power supply node or ground line) connected to wirings on an uppermost layer of a multi-layer wiring

structure via contact electrodes (the electrodes 9a and 9b also serve as contact electrodes), and a capacitor insulating film (7c and 7c) for forming the decoupling capacitor is provided between the wiring layer and the shield layer (5a).

Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the wiring layer that is formed above the shielding layer as taught by Tobita in the structure of Shirley in order to further facilitate the integration of the device.

Regarding claims 6, 8 and 17, Shirley teaches substantially the entire claimed structure of claims 1, 3 and 14 above except explicitly stating that the shield layer comprises a silicon compound of a metal.

Tobita teaches a shield layer comprising a silicon compound of a metal (col. 11, lines 23-28).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the shield layer comprising a silicon compound as taught by Tobita in the structure of Shirley in order to reduce the contact resistance between the shield layer and the diffusion region.

Regarding claims 11, 12 and 19, Shirley teaches the entire claimed structure of claims 1, 3 and 14 above including the semiconductor substrate includes a p-well region and an n-well region. Tobita teaches an example of a CMOS circuit included in the peripheral circuit (Fig. 9A) and a CMOS structure inherently implies the formation of both n-well and p-well regions in the semiconductor substrate (figs. 5 and 9 of Tobita).

Therefore the combined structure of Shirley and Tobita teaches a substrate with both an n-well region and p-well region.

Response to Arguments

6. Applicant's arguments filed 3/06/2007 have been fully considered but they are not persuasive. Applicant argues that the feature that the present electrode comprising the shield layer is extended into the decoupling capacitor while being in the same plane as the plane shape portion that contacts diffusion layer. The new limitation as amended in the claim does not require that the electrode of the decoupling capacitor and the shield layer both be on the same plane.

Conclusion

7. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Samuel A. Gebremariam whose telephone number is (571)-272-1653. The examiner can normally be reached on 8:00am-4:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Richard Elms can be reached on (571) 272-1869. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

SAG
June 9, 2007

Sara Crane
Primary Examiner